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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,444	08/21/2003	Yun-Hyeok Im	9898-320	9520

7590 03/26/2004

MARGER JOHNSON & McCOLLOM, P.C.
1030 S.W. Morrison Street
Portland, OR 97205

EXAMINER

GREENE, PERSHELLE L

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 03/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/646,444	Applicant(s) IM ET AL.	
	Examiner Pershelle Greene	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 10/271094.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/21/03</u> . | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2826

Serial Number: 10/271094

Attorney's Docket #: 9898-253

Filing Date: 8/21/03

Applicant: Im et al.

Examiner: Pershelle Greene

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4 are being rejected under 35 U.S.C. 103(a) as being unpatentable over Mertol (U.S. Patent # 5,909,056), in view of Hirai (U.S. Patent # 6,369,380).

As to claim 1, Mertol discloses a high performance heat spreader for flip chip packages having all of the claimed subject matter:

- A. "a package substrate is met by the substrate 306. Refer to figure 3;
- B. "a semiconductor chip attached to the substrate" is met by the chip 311;
- C. "a TIM formed on the semiconductor chip" is met by the TIM 302;
- D. "a dam that substantially surrounds the TIM" is met by the dam 310 surrounding the TIM 302; and
- E. "a lid placed over the TIM to contact a surface thereof" is met by the lid 301.

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F. “wherein the dam is formed ... and TIM are injected” is met by the dam 310

formed on the substrate 306 and in contact with the sides of the TIM 302 and the semiconductor chip 311, wherein the lid 301 further comprises a supporter 303 for supporting the dam.

Mertol fails to explicitly show the lid comprising injection holes through which materials are required to form the dam and TIM are injected.

Hirai is cited for showing a light receiver unit having a light receiving element and a packaging cover. Specifically, Hirai shows injection holes 18 through which materials required to form the dam and TIM are injected. It would have been obvious to one of ordinary skill in the art to use the injection holes of Hirai for the purpose of injecting a material into the package.

As to claim 2, Mertol shows the lid 301 being attached to the substrate 306 via a sealant 305 and the lid covers the semiconductor chip and the dam.

As to claims 3 and 4, Hirai discloses a dam 19 being formed of a thermosetting epoxy that is not liquefied below about 125°C.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pershelle Greene whose telephone number is 571-272-1917. The examiner can normally be reached on M-F 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Nathan Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PLG
March 18, 2004

NATHAN J. FLYNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

